REMARKS

The application has been carefully reviewed in light of the Office Action dated March 25, 2003 (Paper No. 18). Claims 1 to 16, 23 to 26, 28, 30, 32, 34, 35, 37 to 41 and 43 to 75 are in the application, of which Claims 1, 23, 24, 28, 30, 32, 34 and 40 are independent. Reconsideration and further examination are respectfully requested.

Initially, Applicants thank the Examiner for the indication of allowable subject matter in Claims 28, 32 and 40. In keeping with the indication, Claims 28 and 32 have been amended to be independent. Claim 40, already being in independent form, has been amended to improve consistency and to correct a minor informality.

Claim 11 was objected to over an informality, which has been addressed according to the Examiner's suggestion by the above amendment.

Claims 1, 7 to 16, 23, 24, 30, 37 to 38, 41 and 43 to 48 were rejected under 35 U.S.C. § 102(e) over U.S. Patent 6,203,944 (Turner). Claims 1, 12, 24 to 26, 30, 34, 35 and 39 were rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,283,136 (Peled). Claims 2 to 6 were rejected under 35 U.S.C. § 102(e) over Turner, or alternatively, under 35 U.S.C. § 103(a) over Turner.

In response, claims 1, 23, 24 and 30 have been amended to include the substance of claim 37. This should therefore be viewed as a traversal of the rejection of Claim 37, and of Claim 34, which has not been so amended.

According to Claim 1, the present invention concerns an electrode material for an anode of a rechargeable lithium battery. The electrode material contains a particulate comprising an amorphous Sn•A•X alloy with a substantially non-stoichiometric ratio composition. In the Sn•A•X formula, A indicates at least one kind of an element

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selected from the group consisting of transition metal elements, and X indicates at least one kind of an element selected from the group consisting of N, Mg, Ba, Sr, Ca, La, Ce, Si, Ge, C, P, B, Pb, Bi, Sb, Al, Ga, In, Tl, Zn, Be, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, As, Se, Te, Li and S. X is optionally present and the content of the constituent element Sn of the amorphous Sn•A•X alloy is Sn/(Sn + A + X) = 20 to 80 atomic%. Notably, the particulate comprising the amorphous Sn•A•X alloy has a specific surface area of more than 1 m^2/g.

Claim 23 adds to Claim 1 the feature of the particulate comprising the amorphous Sn•A•X alloy contains carbon element.

Claim 24 differs from Claim 1 in that X, in Claim 24, represents at least one kind of an element selected from a group (a) consisting of Pb, Bi, Al, Ga, In, Tl, Zn, Be, Mg, Ca and Sr; a group (b) consisting of rare earth elements; and a group (c) consisting of metalloide elements. Group (b) consists of La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu. Group (c) consists of B, C, Si, P, Ge, As, Se, Sb and Te.

Claim 30 differs from Claim 1 in that X represents one kind of an element selected from the group consisting of Pb, Bi, Al, Ga, In, Tl, Zn, Be, Mg, Ca and Sr and one kind of element selected from a group consisting of metalloide elements. The group consisting of metalloide elements consists of B, C, Si, P, Ge, As, Se, Sb and Te.

According to Claim 34, the present invention relates to an electrode material for an anode of a rechargeable lithium battery, containing a particulate comprising an amorphous Sn•A•X alloy with a substantially non-stoichiometric ratio composition. In the formula Sn•A•X , A indicates one kind of an element selected from the group consisiting of Co, Ni, Fe, Cr and Cu. In the same formula, X indicates one kind of an element selected

from the group consisting of Si, Ge, Al, Zn, Ca, La and Mg. The content of the constituent element Sn of the amorphous Sn•A•X alloy is Sn/(Sn + A + X) = 20 to 80 atomic%.

Thus, according to one feature of the rejected claims herein, a particulate comprises an amorphous Sn•A•X alloy where the content of Sn is 20 to 80 atomic%; and with regard to Claims 1, 23, 24 and 30, the amorphous alloy has a specific surface area of more than 1 m^2/g. As described in the specification beginning at line 20 on page 59, in terms of representative embodiments of the invention, a large specific surface area can contribute to the reactivity of the amorphous alloy particulate to promote uniformity in reaction, and to allow the particulate to be handled more readily.

The applied art is not seen to teach or suggest the features of the present invention. In particular, the applied art is not seen to teach a particulate comprising an amorphous Sn•A•X alloy having a specific surface area of more than 1 m^2/g, as recited in Claims 1, 23, 24 and 30. In addition, Peled is not seen to teach or suggest that the content of the constituent element Sn of the amorphous Sn•A•X alloy is Sn/(Sn + A + X) = 20 to 80 atomic%, as recited in Claims 1, 23, 24, 30 and 34.

Turner is seen to teach electrodes for a lithium battery comprising a composition comprising an electrochemically active metal element such as Sn and a non-electrochemically active metal element such as Mo, Nb, W, Ta, Fe or Cu having a crystal region of less than 500 angstroms. Turner is also seen to disclose intermetallic compounds such as Sn_2Fe and $SnFe_3C$.

However, Turner is not seen to teach or suggest either the amorphous property of the present invention or the specific surface area recited in the claims under examination. For example, Turner is not seen to teach a particulate comprising an

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amorphous Sn•A•X alloy. The reference is only seen to discuss electrodes with crystalline and matrix phase microstructures, and is therefore unrelated to the amorphous alloy particulates of the invention.

Furthermore, Turner is not seen to teach a particulate comprising an amorphous Sn•A•X alloy having a specific surface area of more than 1 m^2/g. In fact, Turner is not seen to discuss any range of specific surface area. As discussed on page 59 to 60 of the subject application, an amorphous alloy particulate should have a large specific area. The feature may allow for increased reactivity of the amorphous alloy particulate with lithium deposited during battery charging and may allow for improved handling of the amorphous alloy particulate.

With reference to lines 57 to 66 of Column 2, Peled is seen to teach anodes which comprise lithium, aluminum, magnesium and one or more of a list of other elements, which include Sn. While it is true that the elements other than lithium, aluminum and magnesium may, combined, amount to 40% anode weight, no one element other than lithium, aluminum and magnesium may amount to more than 5% anode weight.[1] Consequently, Peled is seen to teach away from using 20% atomic to 80% of Sn in an electrode.

And like Turner, Peled is not seen even to discuss any range of specific surface area.

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[1]/This point is somewhat difficult to discern from the portion of Peled cited in the Office Action. However, is more readily recognized when one of skill in the art refers to Claim 1 of Peled.

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In view of the forgoing, the independent claims currently pending are seen to be in allowable condition.

The remaining pending claims are each dependent from one or more of the independent claims discussed above and are therefore believed patentable for the same reasons. Because each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration of each claim on its own merits is respectfully requested.

Applicants' undersigned attorney may be reached in our Costa Mesa, California office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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